CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
INFORMATION ITEM

Item No. PWC 09-38

SUBMITTED TO: Chairman McGovern and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: December 16, 2009

SUBJECT: Information Item – Water Efficient Landscape Requirements update Required by the State of California

Analysis: The State of California approved a revised State Water Ordinance per Assembly Bill No. 1881 that requires all agencies to adopt the State Ordinance or a similar one by January 1, 2010. The proposed Ordinance will revise and update existing City of Huntington Beach Municipal Code Section 14.52, Water Efficient Landscape Requirements.

In response to the State requirements of Assembly Bill No. 325 in 1991, the City of Huntington Beach adopted the "Water Efficient Landscape Requirements" in the Municipal Code section 14.52 in 1992. In September 2006, the Governor signed Assembly Bill No. 1881 that mandated the State to revise the State Water Ordinance and require all agencies to either adopt the updated State Ordinance or adopt another ordinance that is at least as effective as the State Ordinance by January 1, 2010. The League of California Cities Orange County Chapter and the Municipal Water District of Orange County (MWDOC), hosted workshops to develop an Orange County Model Water Ordinance that was more appropriate to Orange County than the State Water Ordinance. The City of Huntington Beach was a participant to those meetings. Culmination of that effort was on September 24, 2009.

The City of Huntington Beach Water Efficient Landscape Requirements, Municipal Code Section 14.52, was one of the most comprehensive in the County when it was adopted in 1992. It now has been modified to incorporate those items of the Orange County Model Ordinance that are appropriate to and meet the requirements of Huntington Beach. This latest update is structured to be at least as effective as the State Ordinance requirements and meets the intent of Assembly Bill No. 1881.

The revised Ordinance has:

1) Tightened the formula used to calculate the Maximum Applied Water Allowance, defined as the maximum amount of water a qualifying project can use during a calendar year;
2) Tightened the formula used to calculate the Estimated Total Water Use, which is the actual amount of water that is estimated to be used on the site with the irrigation systems designed and the plant materials used;
3) Additional forms need to be filled out;
4) Additional and updated definitions of terms have been added;
5) Requirements for verification that the proper soil amendments are made;
6) Identifies appropriate plant material selection and additional requirements to eliminate water runoff;
7) Requires additional monitoring of the design and installation to provide improved water efficiency.

By approving the modifications to the existing Water Efficient Landscape Requirements, the City of Huntington Beach will ensure efficiency of landscape water management through the Entitlement, working drawing, plan check and the installation process.

Attachment:
Ordinance Amending MC 14.52

ATTACHMENT #1

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF HUNTINGTON BEACH AMENDING CHAPTER 14.52 OF THE HUNTINGTON BEACH MUNICIPAL CODE RELATING TO WATER EFFICIENT LANDSCAPE REQUIREMENTS

The City Council of the City of Huntington Beach does hereby ordain as follows:

SECTION 1. Section 14.52.010 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.010 Purpose and Intent. The purpose of this chapter is to:

(a) Promote the values and benefits of landscapes while recognizing the need to use water and other resources as efficiently as possible;

(b) Establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new and rehabilitated landscape projects;

(c) Establish provisions for water management practices and water waste prevention for new and existing landscapes;

(d) Establish a long range goal of water efficiency through proper planning and design, the use of technologically current equipment with proper installation, continued maintenance and monitoring of water use through the designed systems;

(e) When used in conjunction with the "Arboricultural and Landscape Standards and Specifications" Resolution Number 4545, to give the Landscape Architect and/or owner the tools to provide an individualized landscape improvement to suit the needs of the owner and the requirements of the city; and

(f) To provide standards for a finished landscape that is physically attractive, conserves water and is easy to maintain.

SECTION 2. Section 14.52.020 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.020 Definitions. For purposes of this chapter, the following words and phrases have the meaning hereafter set forth unless a different meaning is clearly intended from the context in which such word or phrase is used. Any word or phrase not herein defined shall have the meaning attributed to it in ordinary usage.

(a) "anti-drain valve" or "check valve" means a valve located in a lateral line or under a sprinkler head to hold water in the system so it prevents drainage from the lower elevation sprinkler heads when the system is off.

(b) "application rate" means the depth of water applied to a given area, usually measured in inches per minute, inches per hour or gallons per minute or gallons per hour..

(c) "applied water" means the portion of water supplied by the irrigation system to the landscape.

(d) "arboricultural and landscape specifications and standards" means the standards adopted by resolution of the City Council governing the planting, maintenance, removal, fertilization, pruning and bracing of trees.

(e) "automatic irrigation controller" means a mechanical or solid state timer or an automatic timing device capable of operating valve stations to set the days and length of time of a water application in an irrigation system. Smart automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

(f) "backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system

(g) "Certification of Design" means the certification included as Appendix A of these Guidelines that must be included in the Landscape Documentation Package.

(h) "City" means the City of Huntington Beach or its authorized designee.

(i) "common interest development" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

(j) "conversion factor (0.62)" means the number that converts the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows:

(325,850 gallons/43,560 square feet)/12 inches	=	(0.62)
325,850 gallons	=	one acre foot
43,560 square feet	=	one acre
12 inches	=	one foot

To convert gallons per year to 100-cubic feet per year, the city's billing unit for water, divide gallons per year by 748. (748 gallons = 100 cubic feet.)

(k) "Distribution Uniformity" or "DU" is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges form zero to 100 percent.

(l) "drip irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

(m) "drought tolerant" means plant material which, when established in the landscape, is able to grow and survive on little or no additional water than is provided by rainfall.

(n) "ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(o) "effective precipitation" or "usable rainfall" means the portion of total precipitation that is used by the plants.

(p) "emitter" means drip irrigation fittings or devices that deliver water slowly from the system to the soil.

(q) "established landscape" means the point at which plants in the landscape have developed roots into the soil adjacent to the root ball.

(r) "establishment period" means the first year after installing the plant in the landscape.

(s) "estimated total water use" means the annual total amount of water estimated to be needed to keep the plants in the landscaped area healthy. It is based upon such factors as the local evapotranspiration rate, the size of the landscaped area, the types of plants and the efficiency of the irrigation system, as described in this chapter.

(t) "Estimated Applied Water Use" (EAWU) means the average annual total amount of water estimated to be necessary to keep plants in a healthy state, calculated as provided in the Guidelines. It is based on the reference evapotranspiration rate, the size of the landscape area, plant water use factors, and the relative irrigation efficiency of the irrigation system.

(u) "ET adjustment factor" (ETAF) is equal to the Plant Factor divided by the Irrigation Efficiency Factor for a landscape project. The ETAF is calculated in the context of local reference evapotranspiration, using site-specific plant factors and irrigation efficiency factors that influence the amount of water that needs to be applied to the specific landscaped area. A combined plant mix with a site-wide average Plant Factor of 0.5 (indicating a moderate water need) and average irrigation efficiency of 0.71 produces an

ET Adjustment Factor of (0.7) = (0.5/0.71), which is the standard of water use efficiency generally required by this ordinance and the Guidelines; except that the ETAF for a Special Landscape Area shall not exceed 1.0.

(v) "evapotranspiration" ET means the quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time. (The City of Huntington Beach reference evapotranspiration is approximately forty-three (43) inches per year.)

(w) "flow rate" means the rate at which water flows through pipes and valves (gallons per minute or cubic feet per second).

(x) "Guidelines" refers to the Guidelines for Implementation of Water Efficient Landscape Ordinance, as adopted by the local agency, which describes procedures, calculations and requirements for landscape projects subject to this ordinance.

(y) "hardscapes" means any durable material or feature (pervious and non-pervious) installed in or around a landscaped area, such as pavements or walls. Pools and other water features are considered part of the landscaped area and not considered hardscapes for purposes of this ordinance.

(z) "homeowner-installed landscaping" means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This definition excludes speculative homes, which are not owner-occupied dwellings, and which are subject under this ordinance to the requirements applicable to developer-installed residential landscape projects.

(aa) "hydrozone" means a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a non-irrigated hydrozone.

(bb) "infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

(cc) "invasive plants species" or "noxious" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive plant species may be regulated by county agricultural agencies as noxious species.

(dd) "irrigation audit" or "landscape irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a State Regulated and Certified Landscape Irrigation Auditor. An irrigation audit means a process to perform a site inspection that includes, but is not limited to: inspection, system tune-up, system test

with catchment for distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

(ee) "irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

(ff) "Irrigation Management Efficiency" or "IME" means the measurement used to calculate the irrigation efficiency of the irrigation system for a landscaped project. A 90% IME can be achieved by using evaportranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

(gg) "landscape coefficient" means the estimate of water loss from landscape plantings determined by the use of a formula. It is the product of the plant species factor, the plant material density factor, and the microclimate factor. The formula is: landscape coefficient = species factor x density factor x microclimate factor.

(hh) "landscape contractor" means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

(ii) "Landscape Documentation Package" means the documents required to be provided to the City for review and approval of landscape design projects.

(jj) "landscape professional" means a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

(kk) "landscape project" means total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance.

(ll) "landscaped area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance and Estimated Applied Water Use calculations. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other nonirrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

(mm) "lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

(nn) "low volume overhead irrigation" means above ground irrigation heads with an upper flow limit of 0.5 gallons per minute.

(oo) "main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

(pp) "Maximum Applied Water Allowance"(MAWA) means, the upper limit of annual applied water for the established landscaped area. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscaped area. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.

(qq) "mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

(rr) "mulch" means any material such as sawdust, bark or other materials left loose and applied to the soil surface to reduce evaporation.

(ss) "new construction" means, for the purposes of this ordinance, a new building with a landscape or other new landscape such as a park, playground or greenbelt without an associated building.

(tt) "non-pervious" means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

(uu) "operating pressure" means the pressure at which a system of sprinklers is designed by the manufacturer to operate, usually referenced to the base of a sprinkler.

(vv) "overspray" means the water which is delivered beyond the targeted landscaped area, wetting pavements, walks, structures, or other non-landscaped areas.

(ww) "permit" means an authorizing document issued by the City for new construction or rehabilitated landscape.

(xx) "Person" means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the City or the local water purveyor, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

(yy) "pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.

(zz) "plant factor" or "plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species."

(aaa) "precipitation rate" means the rate of application of water measured in inches per hour.

(bbb) "project applicant" means the person submitting a Landscape Documentation Package required to request a permit, plan check, or design review from the City. A project applicant may be the property owner or his or her designee.

(ccc) "Property owner" or "owner" means the record owner of real property as shown on the most recently issued equalized assessment roll.

(ddd) "rain sensing device" or "rain sensing override device" means a system which automatically shuts off the irrigation system when it rains.

(eee) "record drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

(fff) "recreational area" means areas of active play or recreation such as sports fields, school yards, picnic grounds, or other areas with intense foot traffic.

(ggg) "recycled water" or "reclaimed water" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

(hhh) "reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is given in inches per day, month, or year as represented in this chapter and is an estimate of the evapotranspiration of a large field of four (4)- to seven (7)-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the maximum applied water allowance so that regional differences in climate can be accommodated.

(iii) "rehabilitated landscape" means any relandscaping project public or private that requires city processing, or is a condition of approval for a specific project.

(jjj) "run off" means water which is not absorbed by the soil or landscape to which it is applied and flows from the area. For example, run off may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a severe slope.

(kkk) "slope" means the inclined surface of the ground or a roof, generally described as a percentage or ratio of horizontal to vertical distances. For example, a 25% slope gradient is a surface incline with a ratio of four feet horizontal to one foot in height, or a 4 to 1 slope.

(lll) "soil moisture sensing device" means a device that measures the amount of water in the soil.

(mmm) "soil texture" means the classification of soil based on the percentage of sand, silt, and clay in the soil.

(nnn) "Special Landscape Area"(SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

(ooo) "Special Sub-surface Construction" means the products, procedures and results required to provide an adequate tree rooting space that will allow larger trees to be grown in normal tree planting areas and allow the roots from those trees to grow in such a manner that they will not impact the street or infrastructure negatively for an extended period of time.

(ppp) "sprinkler head" means a device which sprays water through a nozzle.

(qqq) "static water supply pressure" means static water supply pressure when water is not flowing.

(rrr) "station" means an area served by one valve or by a set of valves that are operated simultaneously by an automatic controller.

(sss) "Swing joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

(ttt) "turf" means a surface layer of earth containing mowed grass with its roots. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyugrass, Seashore paspalum, St. Augustine grass, Zoysiagrass, and Buffalo grass are warm-season grasses.

(uuu) "valve" means a device used to control the flow of water in the irrigation system.

(vvv) "water efficient" means a combination of landscape features and watering techniques that in the aggregate reduce the demand for and consumption of water. Water efficient also means the result of selecting plant materials that require low amounts of water as opposed to plant materials which require tropical amounts of water.

(www) "Water Efficient Landscape Ordinance" means Ordinance No. _____, adopted by the City Council on _____, 2009, and codified in the Municipal Code in Chapter 14.52.

(xxx) "Water Efficient Landscape Worksheets" means the worksheets required to be completed and which are included in Appendix B hereof.

(yyy) "water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment, habitat protection or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

(zzz) "Watering window" means the time of day irrigation is allowed.

(aaaa) "WUCOLS" means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000. www.owue.water.ca.gov/docs/wucols00.pdf

(bbbb) "Xeriscape," a registered trademark of the National Xeriscape Council, Inc., means plantings which require little or no additional water than is provided by normal rainfall.

SECTION 3. Section 14.52.030 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.030 Director – Duties and Authority. The Director of Public Works shall have authority to perform the following duties:

(a) to enforce the provisions of this chapter and the Arboricultural and Landscape Specifications and Standards of Practice ("the Standards");

(b) to supervise or inspect all work done under any permit or approval issued in accordance with the provisions of this chapter;

(c) to promulgate rules and regulations, and to amend or add to them, for the implementation of the provisions of this chapter and the standards as technology, situations, products and procedures change.

SECTION 4. Section 14.52.040 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.040 Applicability. After January 1, 2010 the provisions of this Chapter shall apply to all new and/or rehabilitated landscaped areas as follows:

(a) Landscape areas for public agency projects and private development projects with a landscape and/or water feature area of 2,500 square feet and greater. These provisions are in addition to building permit requirements and/or entitlement conditions of approval for specific projects and other ministerial permit required projects such as plumbing, electrical, etc., unless exempt by approval of the governing body or specified elsewhere in the ordinance code.

(b) All single family residential projects with less than 2500 square feet of landscaped area that are required to provide a landscape plan as a part of an entitlement, a condition of approval or are in an area described in the Zoning and Subdivision Ordinance as requiring a landscape plan shall follow the following criteria:

(1) The irrigation system design shall follow the requirements described in Section 14.52.060(c), Irrigation Design Plan, with respect to Irrigation efficiency, controllers, sprinkler heads, rain sensors, valves and backflow prevention.

(2) It is unacceptable to allow water to flow or be thrown or sprayed onto hardscapes such as the sidewalk, gutter, street, etc.

(3) The planting plans shall be based upon the proper plant selection and grouping of the plant materials being consistent with specific hydrozones.

SECTION 5. Section 14.52.050 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.050 Exceptions. Except as noted otherwise by special circumstances or by public hearing, the provisions of this chapter shall not apply to:

(a) Any project with a landscaped area less than 2500 square feet installed prior to January 1, 2010, and those projects whose landscape improvements are not required to submit landscape plans; or

(b) Interior remodels, tenant improvements, demolitions and changes of use;

(c) Registered historical sites;

(d) Ecological restoration projects that do not require a permanent irrigation system;

(e) Mined-land reclamation projects that do not require a permanent irrigation system;

(f) Replacement or repair of existing plant material or irrigation systems in conjunction with routine maintenance.

SECTION 6. Section 14.57.060 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.060 Plan Submittal Requirements and Implementation Procedures.

(a) "Conceptual Landscape Plan." All projects that are designated by the Planning Department as applicable to the provisions of this ordinance will require a submittal of a conceptual landscape plan. This plan will be reviewed by the Planning and Public Works Departments to ascertain if the design complies with this chapter of the ordinance. The conceptual landscape plan shall be prepared by a California licensed Landscape Architect and shall indicate the design intent. It shall show and quantify the areas to be hydrozoned, indicate the proposed plant palate as it relates to each separate hydrozone area, provide an area estimate in square feet for each hydrozone and the percentage of each as it relates to the total landscaped area.

Other information relating to the compliance of the project to this chapter shall be submitted with the conceptual landscape plan, including but not limited to a water conservation statement and the type of irrigation system proposed for each hydrozone.

(b) "Working Drawings" or "Landscape Documentation Package" shall include, but not be limited to, a landscape design plan which incorporates the following elements:

(1) The landscaped design plan shall be drawn on 24" x 36" sized project base sheets unless otherwise approved, at an approved scale that accurately and clearly identifies the proposed work to be done, including a north arrow, indication of scale, and any off-site design influencing features;

A. The Landscape Design Plan shall also include the following project information on the cover page:

i. Date

ii. Project name

iii. Project address, parcel and/or lot number(s)

iv. Total landscape area (square feet) and rehabilitated landscape area (if applicable) and any Special Landscape Areas.

v. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed).

vi. Checklist or index of all documents in the Landscape Document Package.

viii. Project contacts to include contact information for the project applicant and property owner.

(2) Designation of all separate hydrozones and a Hydrozone Information Table;

(3) Indicate graphically with symbols the location of all species of plant materials proposed;

(4) Type, location and quantity of all species of plant materials utilized such as trees, shrubs, groundcover, turf and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing and quantities of each group of plants indicated. If abbreviations or symbols are utilized for call outs, a legend shall be provided on each page of the planting plans;

(5) A calculation of the total turf area and its percentage of the total landscaped area;

(6) The location and percentage of the total landscaped area and types of mulch utilized;

(7) A plant materials legend that contains both scientific and common names, quantity, size, descriptive remarks and the percentage of low water use plants shall be provided on each planting plan sheet;

(8) Planting notes, tree staking, plant installation and soil preparation details, specifications and the provision for agricultural soil tests to determine soil amendments for both surface areas and plant backfill;

(9) A calculation of the total landscaped area;

(10) Natural features, including but not limited to, rock outcroppings, existing trees, shrubs that will remain;

(11) Other features that could impact the final design such as electrical transformers, power lines underground or above ground, telephone wires, etc.

(12) Those items listed in the Arboricultural and Landscape Standards and Specifications and Guidelines for Implementation of the Water Efficient Landscape Ordinance;

(13) Designation of recreational area;

(14) Property lines and street names;

(15) Streets, driveways, walkways, and other paved areas;

(16) Pools, ponds, water features, fences, and retaining walls;

(17) Existing and proposed buildings and structures including finish floor elevations and pad elevations if applicable.

(18) Refer to Section 14.52.070(g) for detailed requirements.

(c) The "Irrigation Design Plan" shall be drawn on 24" x 36" sized project base sheets, unless otherwise approved. It shall conform to Arboricultural and Landscape Standards and Specifications. It shall be separate from, but use the same format as, the landscape design plan. The scale shall be the same as that used for the landscape design plan, and the irrigation design plan shall accurately and clearly identify all of the following items:

(1) Location and size of separate water meters for the landscape with a designation of the type (e.g. potable, recycled, well);

(2) Irrigation systems shall be designed to be consistent with hydrozones;

(3) Irrigation plans indicating the layout of each system with the location, type and size of all components of the irrigation system including automatic controllers, main and lateral lines, points of connection, data on valve sizes, gallons per minute (G.P.M.), valve locations, the size and location of sleeves, all moisture sensing devices, flow controls, rain sensing devices, quick couplers, backflow prevention equipment, filters, pressure regulators, spray heads, drip heads, bubblers, etc., for both conventional and drip or microspray systems;

(4) Static water pressure at the point of connection to the public water supply.

(5) Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (PSI) for each station;

(6) Reclaimed water irrigation system as specified in this chapter;

(7) An irrigation legend on each plan sheet indicating all utilized equipment including adaptors, nozzle sizes, G.P.M., P.S.I., radius and other specific information;

(8) Irrigation notes, contruction details of all assemblies and components and specifications;

(9) A recommended irrigation schedule and maintenance schedule;

(10) Grading design plan.

(11) Landscape Architect's professional stamp in the City's format, Landscape Architect's wet signature, contact information (email and phone), the date and the certifying statement: The design of this project complies with the requirements of the City's Water Efficient Landscape Requirements

(Ordinance - MC 14.52), and shall bear the wet signature of the Landscape Architect as required by law.

(12) Maximum Applied Water Allowance (MAWA) and the Estimated Applied Water Use (EAWU), both expressed as annual totals.

A. Water Efficient Landscape Worksheet

B. Water budget calculations

(13) A copy of the calculations clearly identifying all elements of the formula shall be submitted concurrently for maximum applied water allowance (MAWA), and estimated applied water use (EAWU).

(14) Refer to Section 14.52.070(h) for detailed requirements.

(d) Grading design plan, unless a precise grading plan is provided by a Registered Civil Engineer for the project, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing Landscaped Area.

(e) Soil Management Report and/or Specifications, or a provision requiring soil testing and amendment recommendations and implementation to be accomplished after grading has been completed (in this instance, approvals of the Landscape Document Package will not be done until soil testing and recommendations have been completed and are incorporated into the Landscape Document Package).

SECTION 7. Section 14.52.070 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.070 Water Efficient Landscape Calculations, Alternatives and Design Guidelines.

(a) The project applicant shall provide the calculated Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) for the Landscape Project Area as part of the Final Landscape Documentation package submittal to the City. The MAWA and EAWU shall be calculated based on completing the Water Efficient Landscape Worksheets (in accordance with the sample worksheets in Appendix B.) All worksheets, calculations and other related items shall be incorporated onto the design plans within the Landscape Document Package.

(b) The EAWU projected for the landscaped area shall not exceed the MAWA. The MAWA shall be calculated using an Evapotranspiration Adjustment Factor (ETAF) of 0.7, except for the portion of the MAWA applicable to any Special Landscape Areas within the project, which shall be calculated using an ETAF of 1.0. Where the design of the landscaped area can otherwise be shown to be equivalently water-efficient, the applicant may submit alternative or abbreviated

information supporting the demonstration that the annual Estimated Applied Water Use is less than the Maximum Applied Water Allowance, for the review and approval by the City.

(c) Water budget calculations shall adhere to the following requirements:

(1) The Maximum Applied Water Allowance shall be calculated using the worksheet and equation presented in Appendix B on page 1. The example calculation on page 2 is a hypothetical example to demonstrate proper use of the equation. All numbers used shall be shown in the equations.

(2) The Estimated Applied Water Use shall be calculated using the water efficient landscape worksheet and equation presented in Appendix B.

(3) For the calculation of the Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU), a project applicant shall use the ETo value of 43 inches per year in Huntington Beach.

(4) For calculation of the EAWU, the plant water use factor shall be determined as appropriate to the project location from the Water Use Efficiency of Landscape Species (WUCOLS) Species Evaluation List. The plant factor is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.

(5) For calculation of the EAWU, the plant water use factor shall be determined for each valve hydrozone based on the highest-water-use plant species within the zone. The plant factor for each hydrozone may be required to be further refined as a "landscape coefficient" according to protocols defined in detail in the WUCOLS document, to reflect planting density and microclimate effects on water need, if required by the City Landscape Architect.

(6) For calculation of the EAWU, the area of a water feature shall be defined as a high water use hydrozone with a plant factor of 1.0.

(7) For calculation of the EAWU, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use hydrozone with a plant factor of 0.1.

(8) For calculation of the MAWA, the ET Adjustment Factor (ETAF) for Special Landscape Areas shall be set at 1.0. For calculation of the EAWU, the ETAF for Special Landscape Areas shall be calculated as the SLA Plant Factor divided by the SLA Irrigation Efficiency Factor.

(9) Irrigation Efficiency shall be calculated using the worksheet and equation presented in Appendix B.

(d) The Maximum Applied Water Allowance.

(1) A project's Maximum Applied Water Allowance shall be calculated using the following formula:

MAWA =	(ETo) (0.7) (LA) (0.62) where:
MAWA =	Maximum Applied Water Allowance (gallons per year)
ETo =	Reference Evapotranspiration (inches per year) (43 inches per year in Huntington Beach)
0.7 =	ET adjustment factor
LA =	Landscaped Area (square feet)
0.62 =	Conversion factor (to gallons per square foot)

(2) An example for calculations of the Maximum Applied Water Allowance is:

Project Site:	Landscaped area of 50,000 sq. ft. in Huntington Beach.
MAWA =	(ETo) (0.7) (LA) (0.62) (43 inches) (0.7) (50,000 sq. ft.) (0.62)

Maximum Applied Water Allowance (for this example) = 1,333,000 gallons per year (or 1,758 hundred-cubic-feet per year: 1,333,000 divided by 748 = 1758.6).

(3) It is conceivable that landscaped areas in public and private projects, including but not limited to, parks, playgrounds, sports fields, golf courses, cemeteries, or school yards where turf provides a playing surface or serves other recreational or approved passive purposes may require water in addition to the Maximum Applied Water Allowance. (Those Special Landscape Areas shall have had the MAWA calculated utilizing an ET Adjustment Factor of 1.0). If this is the case, a statement shall be included with the landscape design plan, designating areas to be used for such purposes and specifying any needed amount of additional water above the Maximum Applied Water Allowance. The applicant shall have tried to balance the additional water anticipated for the active turf areas with other areas that require substantially less water, such as those with a plant factor in the 0 to 0.3 range.

(e) Estimated Applied Water Use (EAWU).

(1) The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.

(2) A calculation of the Estimated Applied Water Use shall be submitted with the Landscape Documentation Package. It may be calculated by summing the amount of water recommended in the irrigation schedule.

(f) Soil Management Report.

(1) In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:

A. Submit soil samples to a certified agronomic soils laboratory such as Wallace Laboratories or Soil and Plant Laboratories for analysis and recommendations.

i. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

ii. The soil analysis shall at a minimum include soil texture; infiltration rate determined by an on site percolation test, a laboratory test or soil texture infiltration rate table, pH, total soluble salts, sodium;

B. Determination of soil texture, indicating the percentage of organic matter.

C. A soil fertility and an agricultural suitability analysis shall be provided which includes but is not limited to a description analysis for half saturation percentage, ph, salinity, nitrate, nitrogen, ammonium nitrogen, phosphate phosphorus, potassium, calcium, magnesium, salinity boron and sodium absorption ratio. A descriptive narrative shall indicate procedures and provide soil recommendations for both general soil preparation; and backfill mixes, and continuing maintenance fertilizer applications, and recommendations.

D. The project applicant, or his/her designee, shall comply with one of the following:

i. If significant mass grading is not planned, the soil analysis report shall be submitted to the City as part of the Landscape Documentation Package; or

ii. If significant mass grading is planned, the soil analysis report shall be submitted to the City prior to initiating any construction. In this instance the requirement of approving precise grading plans and the Landscape Document Package simultaneously will be waived to allow soil test results to be available to the Landscape Architect prior to his Landscape Document Package being completed. The Landscape Document Package will then be required prior to the first building inspection for foundations.

iii. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans, irrigation design plans and, if necessary, the precise grading plans to make any necessary adjustments to the design plans.

iv. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the City Landscape Architect prior to obtaining a final Certificate of Occupancy. (3183-2/93)

(2) A mulch of at least three (3) inches shall be applied to all planting areas except turf and living ground coverings. Refer to Section 14.52.060(b) for basic plan requirements.

(g) Landscape Design Plan. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

(1) Plant Selection and Grouping. Any plants may be used in the landscape, providing the Estimated Applied Water Use (EAWU) recommended does not exceed the Maximum Applied Water Allowance (MAWA) and that the plants meet the specifications set forth in the following paragraphs and the Arboricultural and Landscape Standards and Specifications;

A. protection and preservation of non-invasive water-conserving plant species and water-conserving turf;

B. selection of water-conserving plant species and water-conserving turf;

C. selection of plants based on disease and pest resistance;

D. selection of trees based on available planting area and Special Sub-Surface Construction provisions to allow maturity to occur without damaging infrastructure.

E. selection of plants from local and regional landscape program plant lists.

(2) Plants having similar water use shall be grouped together in distinct hydrozones;

(3) Plants shall be selected appropriately based upon their adaptability to the climatic, geologic, and topographic conditions of the site. Protection and preservation of native species and natural areas is encouraged. The planting of trees is encouraged wherever it is consistent with the other provisions of this ordinance. To encourage the efficient use of water, the following is highly recommended:

A. use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;

B. recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); and

C. consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

(4) Fire prevention needs shall be addressed in areas that are fire prone. Information about fire prone areas and appropriate landscaping for fire safety is available from the Fire Department. . When conflicts between water conservation and fire safety design elements exist, the fire safety requirements shall have priority.

(5) Lawn or turf areas: Lawn areas shall be minimized. The amount of lawn area shall not exceed 25% of the total landscaped area on any project with the exception of high use facilities such as parks or play fields (Special Landscaped Areas). Lawn areas less than ten feet in any dimension are discouraged. Narrow strips of lawn areas are specifically discouraged. Lawn areas shall not exceed a four (horizontal length) to one (vertical height), or a 25% slope ratio on sloping sites or bermed areas.

(6) The use of artificial turf may be considered in certain instances where lawn is desired per the above, where lawn is specifically discouraged or where the lawn area exceeds the maximum allowed percentage of

landscaped area. (Special installation requirements are required for public rights of way).

(7) The use of invasive plant species and/or noxious plant species is not acceptable.

(8) The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of water efficient plant species as a group.

A. Water Features

i. Recirculating water systems shall be used for water features.

ii. Where available and consistent with public health guidelines, recycled water shall be used as a source for decorative water features.

iii. The surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

iv. Water evaporation from pools and spas is significant and covers are highly desirable and recommended.

B. Mulch and Amendments

i. minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.

ii. Stabilizing/mulching products such as Excelsior matting or the approved equivalent shall be used on slopes.

iii. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

iv. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected.

(9) The landscape design plan, at a minimum, shall:

A. delineate and label each hydrozone by number, letter, or other method;

B. identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscaped area shall be included in the low water use hydrozone for the water budget calculation;

C. identify recreational areas;

D. identify areas permanently and solely dedicated to edible plants;

E. identify areas irrigated with recycled water;

F. identify areas irrigated with grey water;

G. identify type of mulch and application depth;

H. identify soil amendments, type, and quantity;

I. identify type and surface area of water features;

J. identify hardscapes (pervious and non-pervious);

K. identify location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Storm water best management practices are encouraged in the landscape design plan and shall be designed to eliminate vector habitat concerns. Examples include, but are not limited to:

   i. infiltration beds, swales, and basins that allow water to collect and soak into the ground;

   ii. constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and

   iii. pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

L. identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);

M. contain the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and have applied them for the efficient use of water in the landscape design plan;" and

N. bear the wet signature of a California-licensed Landscape Architect.

(h) Irrigation Design Plan. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following conditions shall be submitted as part of the Landscape Documentation Package. Refer to Section 14.52.060(c) for basic plan requirements.

(1) Irrigation Design Criteria.

A. Runoff and Overspray. Soil types and infiltration rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to eliminate runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to the soil infiltration rates therefore eliminating runoff.

i. Special attention shall be given to avoid runoff on slopes and to eliminate overspray in plant areas with a width less than ten (10) feet and in median strips.

ii. Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or a low volume irrigation system, providing 100% coverage of the planting area with no overspray.

B. Irrigation Efficiency. Average irrigation efficiency for the project shall be determined in accordance with the EAWU calculation sheet in Appendix B. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant, the irrigation efficiency of the irrigation heads used within each hydrozone shall be assumed to be:

Pop-up stream rotator heads = 75%
Stream rotor heads = 75%

Microspray = 75%
Bubbler = 80%
Drip emitter = 85%
Subsurface irrigation = 90%

C. The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

i. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

ii. Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

D. Water Meters. Separate landscape water meters shall be installed for all projects except for single family homes. However, single family homes with sub-potable or reclaimed water systems require a separate meter and additional preventative safety measures.

E. Controllers. Automatic control systems shall be required for all irrigation systems and must be able to accommodate all aspects of the design utilizing either evapotranspiration or soil moisture sensor data, including dual programs and/or multiple repeat features and/or "smart" type controller technology.

i. Valves. Plants which require different amounts of water shall be irrigated by separate valves as a part of the Hydrozone requirement. If one valve is used for a given area, only plants with similar water use shall be used in that area. Anti-drain (check) valves shall be installed in strategic points to prevent low-head drainage and are required on all irrigation systems. (Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required as close as possible to the point of connection of the water supply downstream from the backflow prevention device, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

ii. Backflow prevention devices shall be required to protect the potable water supply from contamination by the irrigation system. A project applicant shall refer to the applicable City code (i.e., the Building Dept., and/or public health) for additional backflow prevention requirements, and shall utilize City Standards for installation.

F. Sprinkler Heads. Heads and emitters shall have consistent application rates and matched precipitation rates within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations and the types of plant materials used.

i. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

G. Rain Sensing Override Devices. Rain sensing override devices shall be required on all irrigation systems.

H. Soil Moisture Sensing Devices. Soil moisture sensing devices are required to be used in lawn areas for projects with a total of 5,000 square feet and greater of total landscaped area. A minimum of one (1) moisture sensing device shall be utilized per turf area. Soil moisture sensing devices shall be considered where appropriate for shrub areas.

I. Flow Control Sensing Devices. Projects with 10,000 square feet or more of landscaped area are required to have one (1) flow control valve per point of connection. All other sized systems are recommended to utilize flow control sensing devices.

J. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems so as to match the irrigation systems application rate to the infiltration rate of the soil.

K. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

i. It is highly recommended that the project applicant or Landscape Architect inquire with the water operations yard

about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

ii. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone. Refer to item (J) above.

L. Hydrozone

i. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

ii. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

iii. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.

iv. Individual hydrozones that mix plants of moderate and low water use or moderate and high water use may be allowed if:

(a) the plant factor calculation is based on the proportions of the respective plant water uses and their respective plant factors; or

(b) the plant factor of the higher water using plant is used for the calculations.

v. Individual hydrozones that mix high and low water use plants shall not be permitted.

vi. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve and assign a number to each valve.

M. Overhead Irrigation. Overhead irrigation may not be acceptable for the areas within 24 inches of any non permeable surface. There shall be NO overspray onto any hardscape or other non-permeable surfaces, nor shall there be any runoff allowed onto hardscape or other non-permeable surfaces. Allowable irrigation within the 24 inch setback from non-

permeable surfaces may include drip, drip-line, surface-flow, or other low flow non spray technology.

These restrictions may be modified IF:

i. the landscape area is adjacent to permeable surfacing and no runoff occurs; or

ii. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

ii. the irrigation designer specifies an alternative design or technology, as part of the Landscape Document Package and clearly demonstrates strict adherence to irrigation system design criteria in section 14.52.070(h). Prevention of overspray and runoff must be confirmed during an irrigation system survey and physical test or possibly with an official irrigation audit if required by the City Landscape Architect or inspector.

O. Slopes. Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer of the landscape project specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation system survey and physical test or possibly with an official irrigation audit if required by the City Landscape Architect or inspector.

P. The irrigation design plan, at a minimum, shall contain:

i. the location and size of separate water meters for landscape;

ii. the location, type, and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;

iii. static water pressure at the point of connection to the public water supply;

iv. flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;

v. irrigation schedule parameters necessary to program smart timers specified in the landscape design;

vi. the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them accordingly for the efficient use of water in the irrigation design plan;" and

vii. the wet signature of a California-licensed landscape professional.

(i) Irrigation Schedule Plan. The Irrigation Schedule Plan, at a minimum, shall contain:

(1) An annual irrigation program with monthly irrigation schedules shall be required for the plan establishment period, for the established landscape, and for any temporarily irrigated areas.

(2) The irrigation schedule shall:

A. include run time (in minutes per cycle), suggested number of cycles per day, and frequency of irrigation for each station, and;

B. indicate the amount of applied water (in hundred cubic feet, or gallons) recommended on a monthly and annual basis.

(3) The total amount of water for the project shall include water designated in the estimated total water use calculation plus water needed for any water features, which shall be considered as a high water using hydrozone.

(4) Recreational areas designated in the landscape design plan shall be highlighted and the irrigation schedule shall indicate if any additional water is needed above the MAWA (maximum applied water allowance), because of high plant factors (but not due to irrigation inefficiency).

(5) Irrigation scheduling shall incorporate the use of evapotranspiration data as available, such as those from the California Irrigation Management Information System (CIMIS) weather stations to apply the appropriate levels of water for different climates.

(6) Landscape irrigation shall be primarily scheduled between 2:00 a.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature.

(j) Grading Design Plan. Grading design plans satisfying the following conditions shall be submitted as part of the Landscape Documentation Package.

(1) A grading design plan shall be drawn on 24" x 36" sized project base sheets, unless otherwise approved. It may be separate from but use the same format and scale as the landscape design plan.

(2) The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade, and storm water retention improvements, if applicable.

(3) To prevent excessive soil erosion and runoff, it is highly recommended that the project design professional do the following:

A. grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;

B. avoid disruption of natural drainage patterns and undisturbed soil; and

C. avoid soil compaction in landscaped areas.

(k) Post-Installation Landscape and Irrigation Maintenance

(1) Landscapes shall be maintained to ensure water use efficiency in accordance with existing Municipal Codes, the Zoning and Subdivision Ordinance, the Arboricultural and Landscape Standards and Specifications and this Water Efficient Landscape Requirements Ordinance.

A. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

i. Irrigation scheduling shall be regulated by automatic irrigation controllers.

ii. Overhead irrigation shall be scheduled in accordance with the City's Water Conservation Ordinance. Operation of the irrigation system outside the normal watering window is allowed for plant establishment period of 90 to 365 days maximum, water auditing and system maintenance.

(l) Maintenance Schedules. A regular maintenance schedule satisfying the following conditions shall be submitted as part of the Landscape Documentation Package:

(1) Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule shall include but not be limited to checking,

adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning, and weeding in all landscaped areas.

(2) Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents.

(m) Landscape Irrigation Audit Schedules. A schedule of landscape irrigation audits, for all projects with a landscaped area of 10,000 square feet and larger, satisfying the following conditions shall be submitted to the city as part of the Landscape Documentation Package.

(1) Refer to Certification.

(2) At a minimum, audits shall be in accordance with the State of California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook, the entire document, which is hereby incorporated by reference. (See Landscape Irrigation Auditor Handbook (June 1990) version 5.5 (formerly Master Auditor Training.)

(3) It is recommended that landscape irrigation audits be conducted by certified landscape irrigation auditors at least once every five years.

(n) Public Education. Signs shall be used to identify all model home complexes as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment and others which contribute to the overall water efficient theme. Information shall be provided about designing, installing, and maintaining water efficient landscapes.

SECTION 8. Section 14.52.095 of the Huntington Beach Municipal Code is hereby added to read as follows:

14.52.095 Provisions for Existing Landscapes.

(a) Irrigation of all landscaped areas shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and water waste prevention, as determined and implemented by the City.

(b) The City may administer programs such as irrigation water use analyses, irrigation surveys, tiered water rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a MAWA calculated with an ETAF of 0.8 to all landscaped areas in the City over one acre in size.

(c) The architectural guidelines of a common interest development, including apartments, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

(d) Reclaimed Water. The installation of reclaimed water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of reclaimed water, unless a written exemption has been granted by the Public Works Water Division, stating that reclaimed water meeting all health standards is not available and will not be available in the foreseeable future.

(e) The reclaimed water irrigation system shall be designed and operated in accordance with all codes, and shall include but not be limited to the use of purple pipe and fittings for the total reclaimed water system. Refer to the "Rules and Regulations for the Use of Reclaimed Water" (available at the Water Department) for more information.

(f) For single family residential lots with reclaimed water, there shall be no hose bibbs, loose key or otherwise and no quick couplers installed on the reclaimed system.)

SECTION 9. Section 14.52.100 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.100 Required forms.

SECTION 9. Section 14.52.098 of the Huntington Beach Municipal Code is hereby added to read as follows:

14.52.098 Installation Completion, Certification and Acceptance

(1) Landscape project installation shall not proceed until the Landscape Documentation Package has been approved by the City and any ministerial permits required are issued.

(2) The project applicant shall notify the City at the beginning of the installation work and at intervals, as necessary, for the duration of the landscape project work to schedule all required inspections.

(3) Certification shall be accomplished by completing the Certificate of Substantial Completion as depicted in Section 14.52.100(c) and delivering it to the City Public Works Department, Landscape Architect and to the Owner of Record.

i. A Landscape Installation Certificate of Completion in the form included in Section 14.52.100, which shall include: (i) certification

by a Landscape Architect or licensed Landscape Contractor, or the property owner that the landscape project has been installed per the approved Landscape Documentation Package; and (ii) the following statement: "The landscaping has been installed in substantial conformance to the City approved design plans, and complies with the provisions of the Water Efficient Landscape Ordinance for the efficient use of water in the landscape."

ii. Documentation of the irrigation scheduling parameters used to set the controller(s);

iii. An irrigation audit report from a certified irrigation auditor, documentation of enrollment in regional water purveyor's or the Municipal Water District of Orange County's water conservation programs, and/or documentation that the MAWA and EAWU information for the landscape project has been submitted to the local utilities division, may be required at the option of the City.

(4) A licensed landscape architect and, if applicable, a certified/licensed irrigation designer, shall conduct a final field observation and shall provide a certificate of substantial completion of the entire landscaped area (per city approved plans) to the city prior to acceptance. The certificate shall specifically indicate that plants were installed as specified, that the irrigation system was installed as designed, and that an irrigation audit (if project size warrants it) has been performed, along with a list of any observed deficiencies.

(5) Upon completing the installation of the landscaping and the irrigation system, on project landscape installations totaling 10,000 square feet or greater, an irrigation audit shall be conducted by a certified landscape irrigation auditor prior to the final field inspection and acceptance.

(6) Certification of Completion of the landscape planting and irrigation installations shall be obtained through a Certificate of Use and Occupancy or a Permit Final.

SECTION 10. Section 14.52.100 of the Huntington Beach Municipal Code is hereby amended to read as follows:

14.52.100 Required Forms.

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Site:
Planning Entitlement No.: _____
Project Location:

Tentative Tract No.:

Total Project Landscaped Area in Square Feet: _____
Preliminary project Documentation Submitted: (check indicating submittal)

- ❑ 1. Maximum Applied Water Allowance:
  ___ gallons or cubic feet/year
  ___ percent of the local annual mean precipitation
- ❑ 2. Estimated Applied Water Use:
  ___ gallons or cubic feet/year
- ❑ 3. Estimated Total Water Use:
  ___ gallons or cubic feet/year
- ❑ 4. Landscape Design Plan
- ❑ 5. Irrigation Design Plan
- ❑ 6. Irrigation Schedules
- ❑ 7. Maintenance Schedule
- ❑ 8. Landscape Irrigation Audit Schedule
- ❑ 9. Grading Design Plan
- ❑ 10. Soil Analysis

Post-Installation Inspection: (Check indicating substantial completion)

- ❑ A. Plants installed as specified
- ❑ B. Irrigation system installed as designed
  - ❑ dual distribution system for recycled water
  - ❑ minimal run off or overspray
- ❑ C. Landscape Irrigation Audit performed

❑ Project submittal package and a copy of this certification has been provided to owner/manager and local water agency.

Comments:

_____

I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation substantially conform with the city approved plans and specifications.

Landscape Architect Signature Date
State License No.

I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape irrigation installation substantially conforms with the city approved plans and specifications.

Irrigation Design/Consultant Signature Date
State License No.

I/we certify that I/we have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents and the City of Huntington Beach Arboricultural and Landscape Standards, Specifications and the Water Efficient Landscape Ordinance.

Owner/Developer Signature Date
Title

LANDSCAPE WATER CONSERVATION CONCEPT STATEMENT

Project: _____ Planning Entitlement Number: _____
Public Works Plancheck Number_____
Project Location:
Tentative Tract Number:
Landscape Architect/Irrigation Designer/Contractor:

Total Landscape Planting area in square feet: _____
Total Special Landscape area in square feet

Included in this project submittal package are:
(Check to indicate completion and circle descriptive amount)

1. Maximum Applied Water Allowance:
   _____ gallons or cubic feet/year
2. Estimated Applied Water Use:
   _____ gallons or cubic feet/year
3. Landscape Design Plan
4. Irrigation Design Plan
5. Irrigation Schedules
6. Maintenance Schedule
7. Landscape Irrigation Audit Schedule

8. Grading Design Plan
9. Soil Analysis

Description of Project
(Briefly describe the planning and design actions that are intended to achieve conservation and efficiency in water use.)

Prepared by:
Title:
CA License No.:

Date:

Appendix A

CERTIFICATION OF LANDSCAPE DESIGN

I hereby certify that:

(1) I am a professional Landscape Architect appropriately licensed in the State of California to provide professional landscape design services.

(2) The landscape design and water use calculations for the property located at ____

_____

_____ (provide street address or parcel number(s)) were prepared by me or under my supervision.

(3) The landscape design and water use calculations for the identified property comply with the requirements of the City of Huntington Beach Water Efficient Landscape Requirements Ordinance (Municipal Code Section 14.52).

(4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the City of Huntington Beach Guidelines for Implementation of the City of Huntington Beach Water Efficient Landscape Requirements.

_____ _____

Print Name Date

_____ _____

Signature License Number

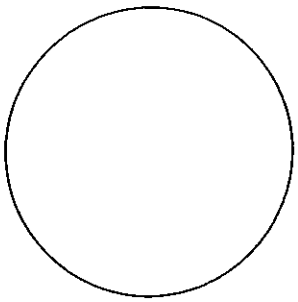
_____

Address

_____ _____

Telephone E-mail Address

Landscape Design Professional's Stamp
(If applicable)



A-1

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:
MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor (ETAF)*
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Special Landscaped Area (square feet)

Example Calculation: a hypothetical landscape project in Huntington Beach, CA with an irrigated landscaped area of 40,000 square feet with 10,000 square feet of *Special Landscaped Area*. To calculate *MAWA*, the annual *reference evapotranspiration* value for Huntington Beach is 43.0 inches.

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA* (Gallons Per Year)
MAWA for LA	43.0	x	0.7	x	40,000	x	*0.62*	=	746,480
= *MAWA* for *SLA* =	43.0	x	1.0	x	10,000	x	*0.62*	=	266,600
Total *MAWA* =					50,000				1,013,080 Gallons per year for LA+*SLA*

B-1

Estimated Applied Water Use

EAWU = ETo x K_L x LA x *0.62* ÷ *IE* = Gallons per year
where:

EAWU = Estimated Applied Water Use (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
IE = Irrigation Efficiency = IME x DU (See definition in Appendix E for example IE percentages)
IME = Irrigation Management Efficiency (90%)
DU = Distribution Uniformity of irrigation head

$K_L = K_s \times K_d \times K_{mc}$

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

Example Calculation:

	ETo		KL		LA		Conversion		*IE*		*EAWU (Gallons per year)*
Special Landscaped Area	43.0	x	1.00	x	10,000	x	*0.62*	÷	0.75	=	355,467
Cool Season Turf	43.0	x	1.00	x	0	x	*0.62*	÷	0.71	=	0
Warm Season Turf	43.0	x	0.65	x	0	x	*0.62*	÷	0.71	=	0
High Water Using Shrub	43.0	x	0.70	x	0	x	*0.62*	÷	0.71	=	0
Medium Water Using Shrub	43.0	x	0.50	x	15,000	x	*0.62*	÷	0.65	=	307,615
Low Water Using Shrub	43.0	x	0.30	x	25,000	x	*0.62*	÷	0.75	=	266,600
Very Low Water Using Shrub	43.0	x	0.20	x	0	x	*0.62*	÷	0.71	=	0
Other	43.0	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Other	43.0	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Total *EAWU* =					50,000						929,682 Gallons per year

Compare *EAWU* with *MAWA*.
The *EAWU* (929,682 gallons per year) is less than *MAWA* (1,013,080 gallons per year). For this example, the water budget complies with the *MAWA*.

B-2

List *sprinkler heads*, microspray, and drip *emitters* here along with average *precipitation rate* and *Distribution Uniformity of Irrigation Head.*

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection #__

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = *Reference Evapotranspiration* **Appendix C** (inches per year)
0.7 = *Evapotranspiration Adjustment Factor* (ETAF)
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Special Landscaped Area (square feet)

where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration Appendix C (inches per year)
0.7 = Evapotranspiration Adjustment Factor (ETAF)
1.0 = ETAF for Special Landscaped Area
LA = Landscaped Area (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Special Landscaped Area (square feet)

MAWA Calculation:

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA* (Gallons Per Year)
MAWA for LA =		x	0.7	x		x	*0.62*	=	
MAWA for *SLA* =		x	1.0	x		x	*0.62*	=	
Total *MAWA* =									

Estimated Applied Water Use

EAWU = ETo x K_L x LA x *0.62* ÷ *IE* = Gallons per year

where:

EAWU = Estimated Applied Water Use (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
IE = Irrigation Efficiency = IME x DU
IME = Irrigation Management Efficiency (90%)
DU = Distribution Uniformity of irrigation head

$K_L = K_s \times K_d \times K_{mc}$

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

EAWU Calculation:

	ETo		K_L		LA		Conversion		*IE*		*EAWU* (Gallons Per Year)
Special Landscaped Area	43.0	x		x		x	*0.62*	÷		=	
Cool Season Turf	43.0	x		x		x	*0.62*	÷		=	
Warm Season Turf	43.0	x		x		x	*0.62*	÷		=	
Warm Season Turf	43.0	x		x		x	*0.62*	÷		=	
High Water Using Shrub	43.0	x		x		x	*0.62*	÷		=	
Medium Water Using Shrub	43.0	x		x		x	*0.62*	÷		=	
Low Water Using Shrub	43.0	x		x		x	*0.62*	÷		=	
Very Low Water Using Shrubs	43.0	x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
Other		x		x		x	*0.62*	÷		=	

Total *EAWU* =

B-5

List *sprinkler heads*, microspray, and drip *emitters* here along with average *precipitation rate* and *Distribution Uniformity of Irrigation Head.*

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

SECTION 11. Section 14.52.110 of the Huntington Beach Municipal Code is hereby added to read as follows:

14.52.110 Nuisance. It shall be deemed a public nuisance for any person to fail to comply with any of the requirements as described in the foregoing sections.

SECTION 12. Section 14.52.120 of the Huntington Beach Municipal Code is hereby added to read as follows:

14.52.120 Violations – Misdemeanor. Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

SECTION 13. This ordinance shall become effective 30 days after its adoption.

PASSED AND ADOPTED by the City Council of the City of Huntington Beach at a regular meeting thereof held on the _____ day of _____, 200___.

_____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney DLD 12/1/2009

REVIEWED AND APPROVED:

_____
City Administrator

INITIATED AND APPROVED:

_____
Director of Public Works